A systematic review examining the effectiveness of medicines information services for patients and the general public.

Supplementary file 1. Search strategy for EMBASE

#1 'hotline'/exp AND ([embase]/lim OR [embase classic]/lim)

#2 hotline*:ti,ab OR 'hot$line*':ti,ab AND ([embase]/lim OR [embase classic]/lim)

#3 helpline*:ti,ab OR 'help$line*':ti,ab AND ([embase]/lim OR [embase classic]/lim)

#4 'telephone'/exp AND ([embase]/lim OR [embase classic]/lim)

#5 telephone*:ti,ab OR phone*:ti,ab AND ([embase]/lim OR [embase classic]/lim)

#6 'e-mail'/exp AND ([embase]/lim OR [embase classic]/lim)

#7 email*:ti,ab OR 'e-mail*':ti,ab AND ([embase]/lim OR [embase classic]/lim)

#8 'internet'/exp AND ([embase]/lim OR [embase classic]/lim)

#9 'internet*':ti,ab AND ([embase]/lim OR [embase classic]/lim)

#10 online:ti,ab AND ([embase]/lim OR [embase classic]/lim)

#11 webform*:ti,ab OR 'web$form*':ti,ab AND ([embase]/lim OR [embase classic]/lim)

#12 webpage*:ti,ab OR 'web$page*':ti,ab AND ([embase]/lim OR [embase classic]/lim)

#13 website*:ti,ab OR 'web$site*':ti,ab AND ([embase]/lim OR [embase classic]/lim)

#14 'web$based':ti,ab AND ([embase]/lim OR [embase classic]/lim)

#15 'mobile application'/exp AND ([embase]/lim OR [embase classic]/lim)

#16 (((mobile NEXT/2 app):ti,ab) OR ((mobile NEXT/2 apps):ti,ab) OR ((mobile NEXT/2 application*):ti,ab)) AND ([embase]/lim OR [embase classic]/lim)

#17 'mobile device*':ti,ab AND ([embase]/lim OR [embase classic]/lim)

#18 ('social network*' OR twitter OR tweet* OR facebook OR 'instant messag*' OR 'SMS'):ti,ab AND ([embase]/lim OR [embase classic]/lim)

#19 #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18

#20 'pharmacy'/exp AND ([embase]/lim OR [embase classic]/lim)

#21 'clinical pharmacy'/exp AND ([embase]/lim OR [embase classic]/lim)

#22 'hospital pharmacy'/exp AND ([embase]/lim OR [embase classic]/lim)

#23 'pharmacy school'/exp AND ([embase]/lim OR [embase classic]/lim)

#24 (pharmacy:ti,ab OR pharmacies:ti,ab) AND ([embase]/lim OR [embase classic]/lim)

#25 'pharmacist'/exp AND ([embase]/lim OR [embase classic]/lim)

#26 'pharmacy technician'/exp AND ([embase]/lim OR [embase classic]/lim)

#27 pharmacist*:ti,ab AND ([embase]/lim OR [embase classic]/lim)

#28 #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27

#29 ((drug* OR medicine* OR medication*) NEAR/5 (information OR advice OR support OR enquir* OR inquir*)):ti,ab AND ([embase]/lim OR [embase classic]/lim)

#30 #19 AND #28 AND #29

#31 (telepharmac*:ti,ab OR 'tele$pharmac*':ti,ab) AND ([embase]/lim OR [embase classic]/lim)

#32 ('epharmac*':ti,ab OR 'e$pharmac*':ti,ab) AND ([embase]/lim OR [embase classic]/lim)

#33 ((drug* OR medicine* OR medication*) NEAR/5 (hotline* OR hot$line*)):ti,ab AND ([embase]/lim OR [embase classic]/lim)

#34 ((drug* OR medicine* OR medication*) NEAR/5 (helpline* OR help$line)):ti,ab AND ([embase]/lim OR [embase classic]/lim)

#35 ((drug* OR medicine* OR medication*) NEAR/5 'call cent*'):ti,ab AND ([embase]/lim OR [embase classic]/lim)

#36 ((drug* OR medicine* OR medication*) NEAR/5 'information cent*'):ti,ab AND ([embase]/lim OR [embase classic]/lim)

#37 ((drug* OR medicine* OR medication*) NEAR/5 'information service*'):ti,ab AND ([embase]/lim OR [embase classic]/lim)

#38 ((drug* OR medicine* OR medication*) NEAR/5 'information line*'):ti,ab AND ([embase]/lim OR [embase classic]/lim)

#39 #30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38

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Supplementary file 2. Grey literature search strategy

Godin et al. recommend applying a systematic approach when searching for grey literature [1]. Following their recommendations, four grey literature sources were searched:

1) *Grey literature databases*. OpenGrey and ProQuest database for dissertations and theses were searched using the following search terms: 'medicines information', 'medicines helpline', 'drug information', and 'drug helpline'.

2) *Google and Google Scholar*. The Google search involved evaluating the relevance of all available hits when searching for the exact terms 'patient medicines helpline', 'medicines information centre', 'drug information helpline', 'drug information center', and 'drug information service'. The Google Scholar search involved evaluating the relevance of all available hits when searching for the exact terms 'patient medicines helpline', 'medicines information centre' , 'drug information helpline', 'drug information center', and 'drug information service', and then repeating the searches when limiting the terms to appearing in the title only. Limiting the search to 'title only' was recommended by Haddaway et al. [2], who conducted an evaluation using Google Scholar to search for grey literature in seven published systematic reviews.

3) *Targeted websites*. Websites of the following UK conferences were searched for conference proceedings: UK Medicines Information Practice Development Seminar (1998-2017), Royal Pharmaceutical Society Conference (formerly called British Pharmaceutical Conference; 1998-2017), Health Services Research and Pharmacy Practice Conference (1998-2018), and International Social Pharmacy Workshop (2004-2018).

4) *Consultation with experts*. Where possible, the main author of all included studies that were published within the last ten years were contacted, requesting details of any similar research already completed or being carried out, providing that a report of the findings was drafted.

References

1. Godin K, Stapleton J, Kirkpatrick SI, Hanning RM, Leatherdale ST. Applying systematic review search methods to the grey literature: A case study examining guidelines for school-based breakfast programs in Canada. *Systematic Reviews*. 2015;4.

2. Haddaway NR, Collins AM, Coughlin D, Kirk S. The role of google scholar in evidence reviews and its applicability to grey literature searching. PLoS One. 2015;10.

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Data extraction form

Source of study:

Title:

Author:

Year published:

Year of data collection:

Study design/s:

Type of service:

Number of participants/enquiries:

Outcomes:

Type of analysis:

Additional comments:

Supplementary file 4. Quality assessment and risk of bias

Supplementary Table. Quality assessment and risk of bias in peer-reviewed published studies meeting eligibility criteria for the systematic review.

First author, Year published	Total [a]	RoB [b]	QoR	QoSD
Ansani, 2006	45% (9/20)	67% (4/6)	57% (4/7)	43% (3/7)
Badiani, 2017	50% (10/20)	50% (3/6)	57% (4/7)	43% (3/7)
Bramley, 2014	63% (12/19)	40% (2/5)	71% (5/7)	57% (4/7)
Bramley, 2018	55% (11/20)	50% (3/6)	86% (6/7)	29% (2/7)
Conner, 1980	41% (7/17)	33% (1/3)	14% (1/7)	57% (4/7)
Conner, 1982	29% (5/17)	67% (2/3)	29% (2/7)	29% (2/7)
Joseph, 2004	50% (10/20)	83% (5/6)	71% (5/7)	57% (4/7)
Marvin, 2011	65% (11/17)	67% (2/3)	71% (5/7)	71% (5/7)
Maywald, 2004	45% (9/20)	67% (4/6)	57% (4/7)	43% (3/7)
MeInyk, 2000	30% (6/20)	83% (5/6)	43% (3/7)	29% (2/7)
MeInyk, 2000	50% (10/20)	67% (4/6)	43% (3/7)	71% (5/7)
Muhammad, 1998	25% (5/20)	100% (6/6)	14% (1/7)	57% (4/7)
Olofinjana, 2009	60% (12/20)	50% (3/6)	86% (6/7)	43% (3/7)
Rutter, 2012	70% (14/20)	67% (4/6)	86% (6/7)	86% (6/7)
Smith, 1985	45% (9/20)	100% (6/6)	57% (4/7)	71% (5/7)
Williams, 2018 [c]	95% (19/20)	17% (1/6)	100% (7/7)	100% (7/7)

Note. Abbreviations: RoB = risk of bias score (out of a maximum score of 6); QoR = quality of reporting score (out of a maximum score of 7); QoSD = quality of study design score (out of a maximum score of 7).

[a] Quality assessment was measured using the AXIS tool, developed by Downes et al. (2016). Depending on the study design, not all items were relevant. This accounts for the different possible maximum scores across studies.

[b] For the *Risk of Bias* subscale, the items were reversed so that higher scores in this table reflect greater potential for bias. However, the AXIS total score was calculated without reversing the *Risk of Bias* items, to ensure that the reported total score percentages reflect the amount of positively coded items in the tool. This accounts for the apparent discrepancy in this table between the total score and the sum of the subscales for each study.

[c] The study by Williams et al. (2018) was conducted by the authors of this systematic review. Quality assessment and risk of bias for this study was conducted by two postgraduate students who were independent of the study team.